

FIG. 1

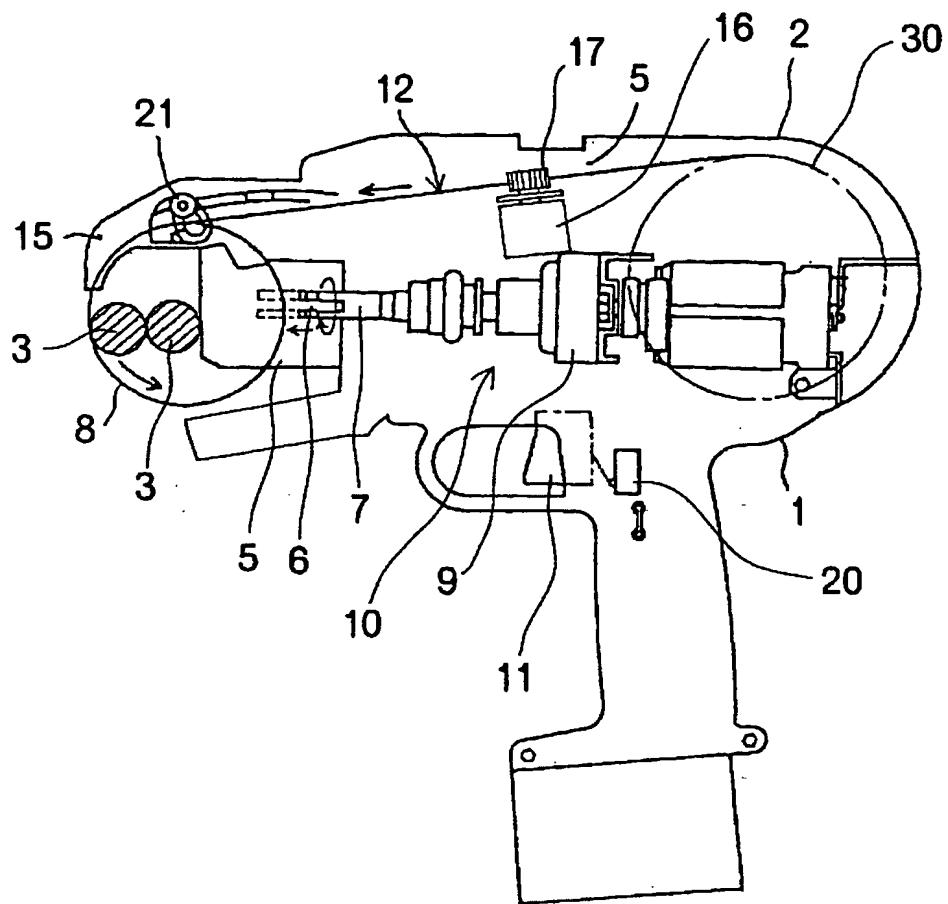


FIG. 2

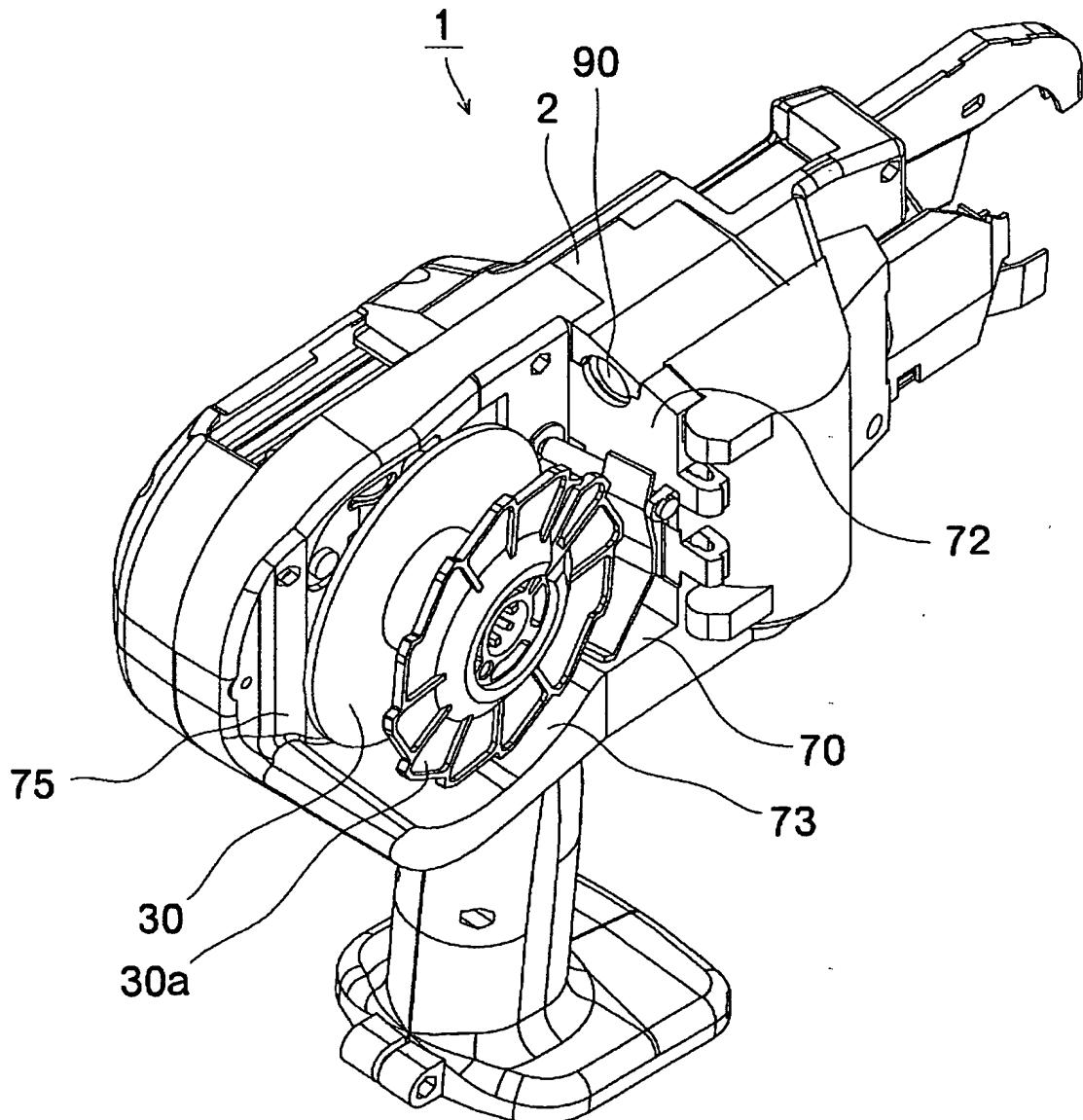


FIG. 3

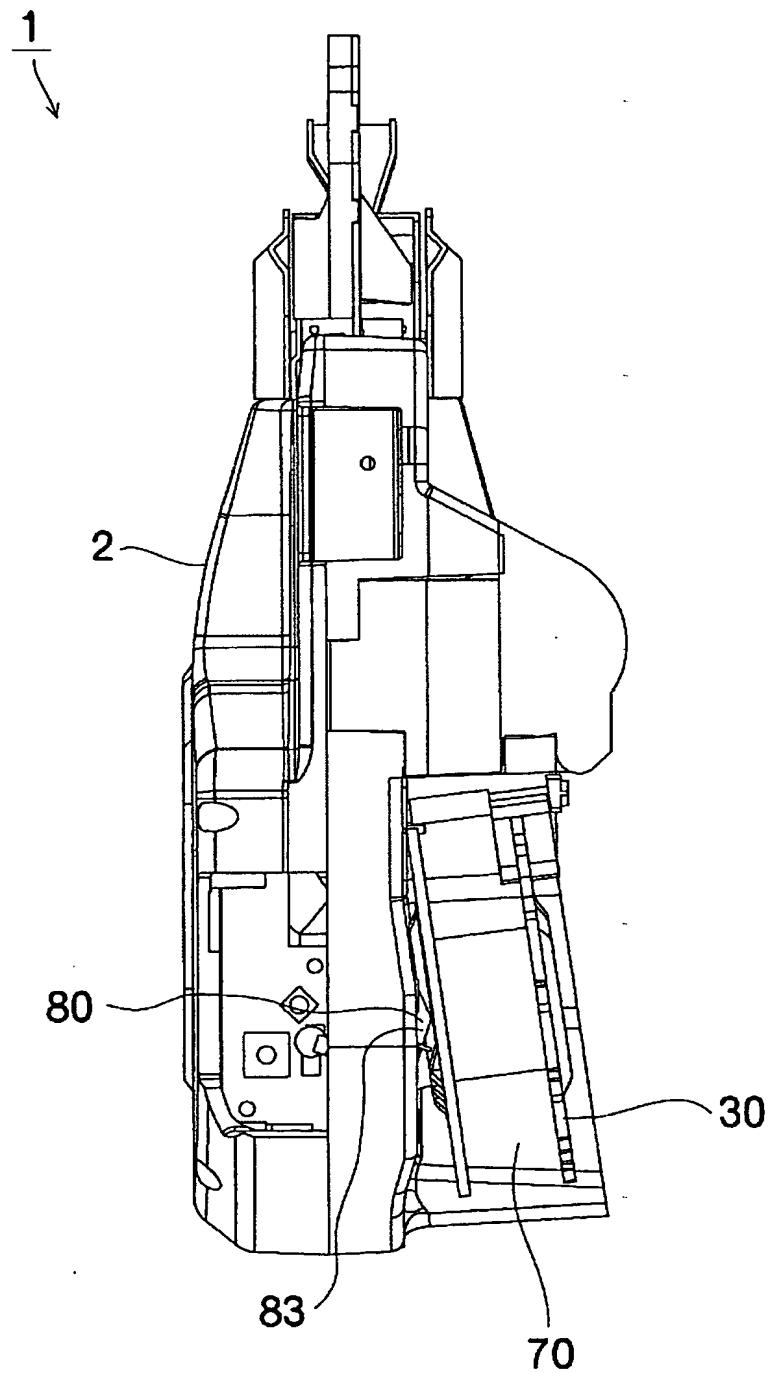


FIG. 4

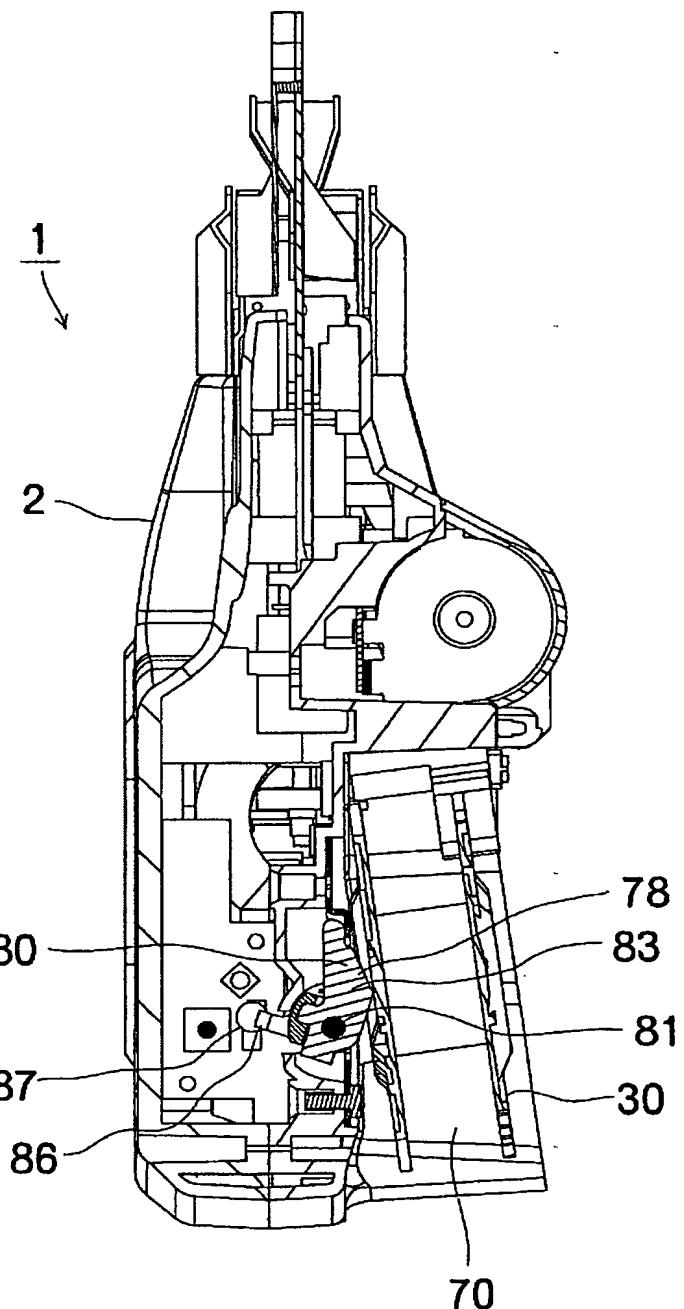


FIG. 5

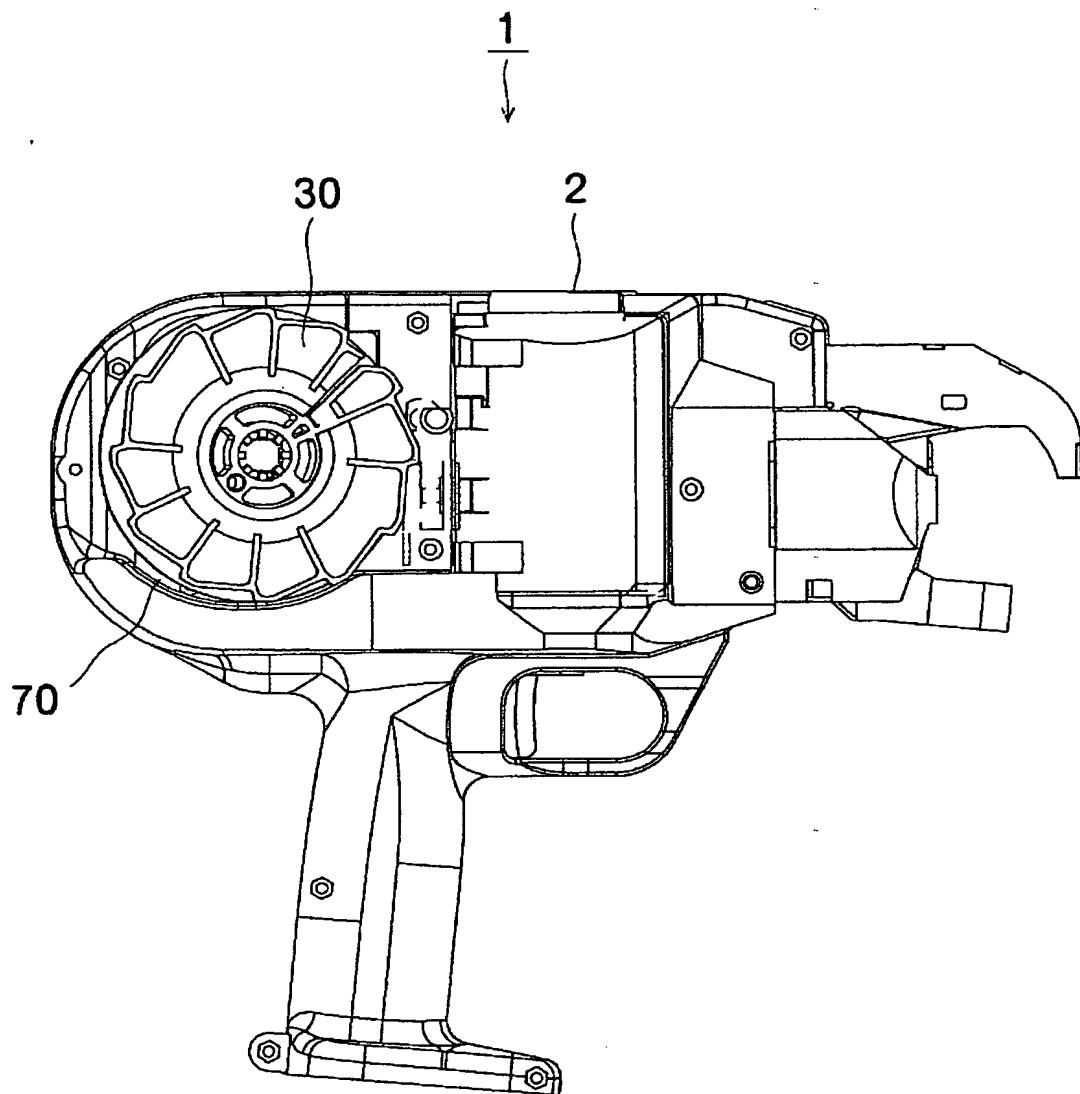


FIG. 6

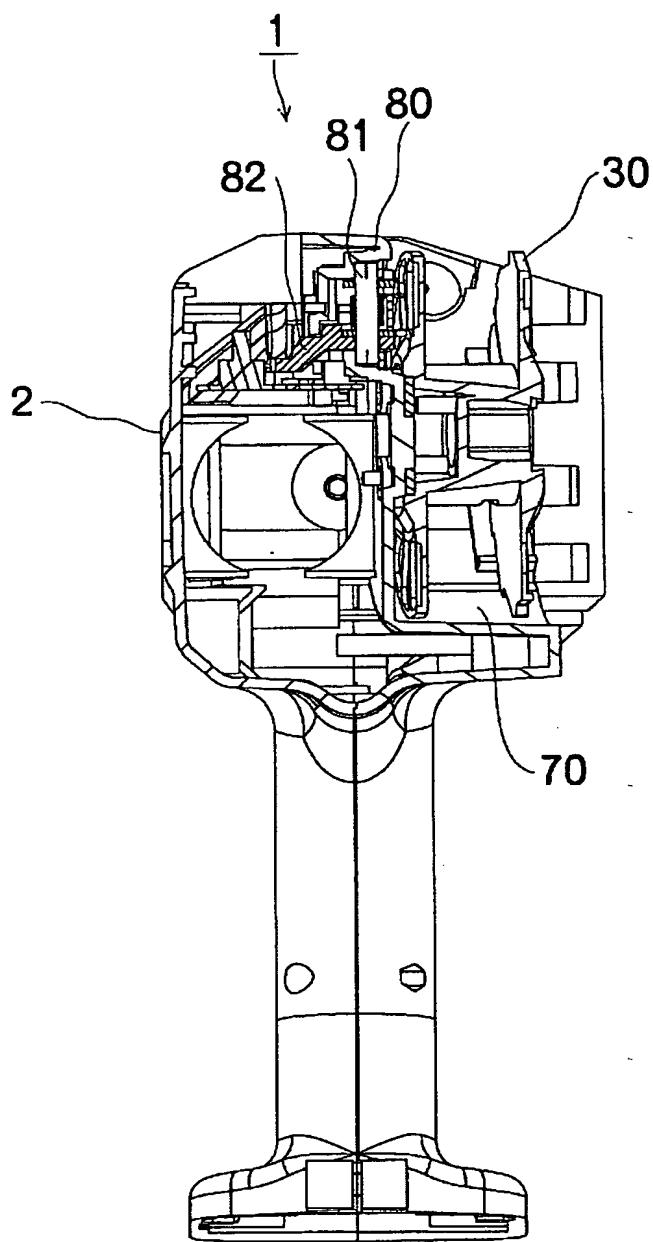


FIG. 7

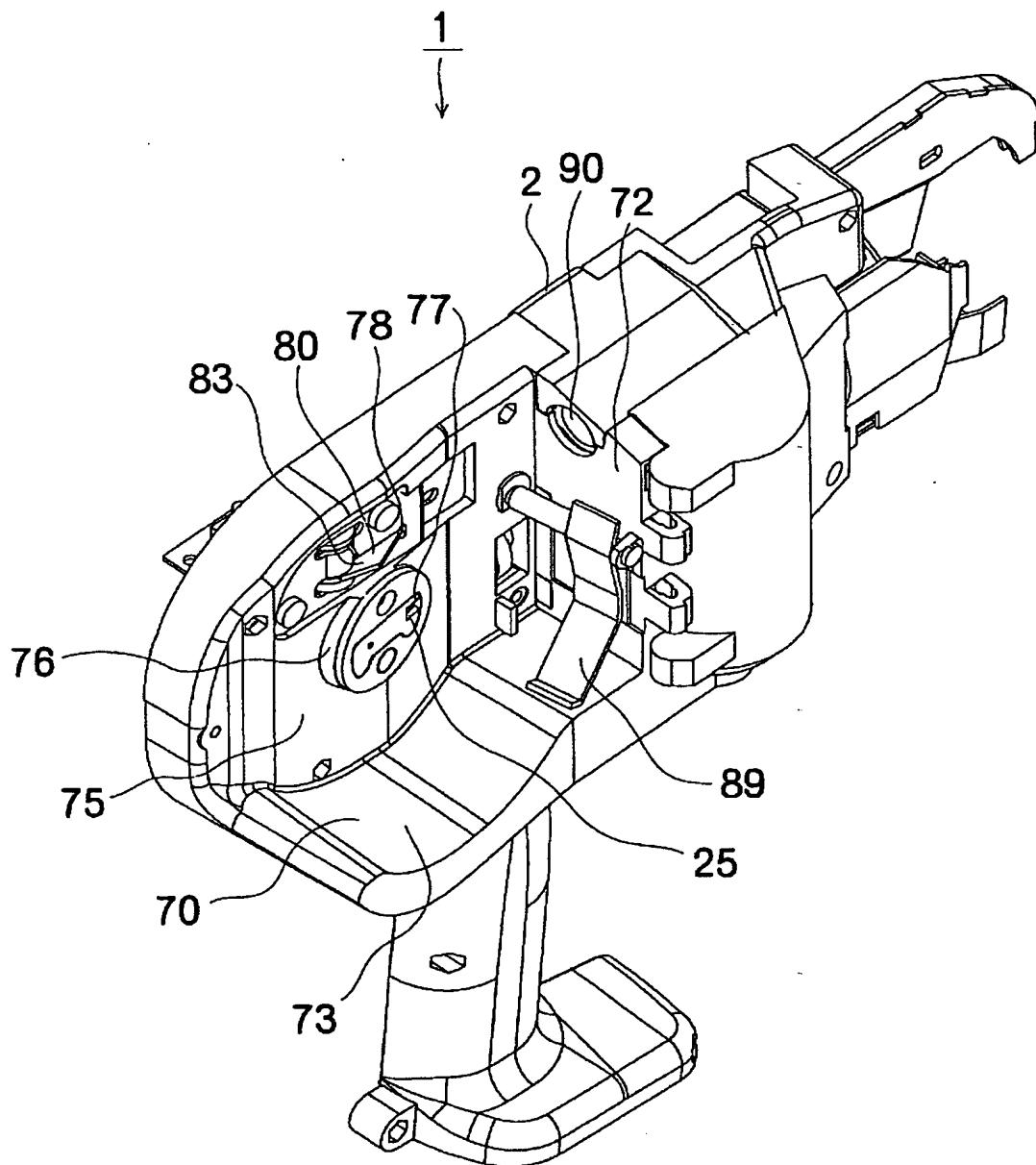


FIG. 8

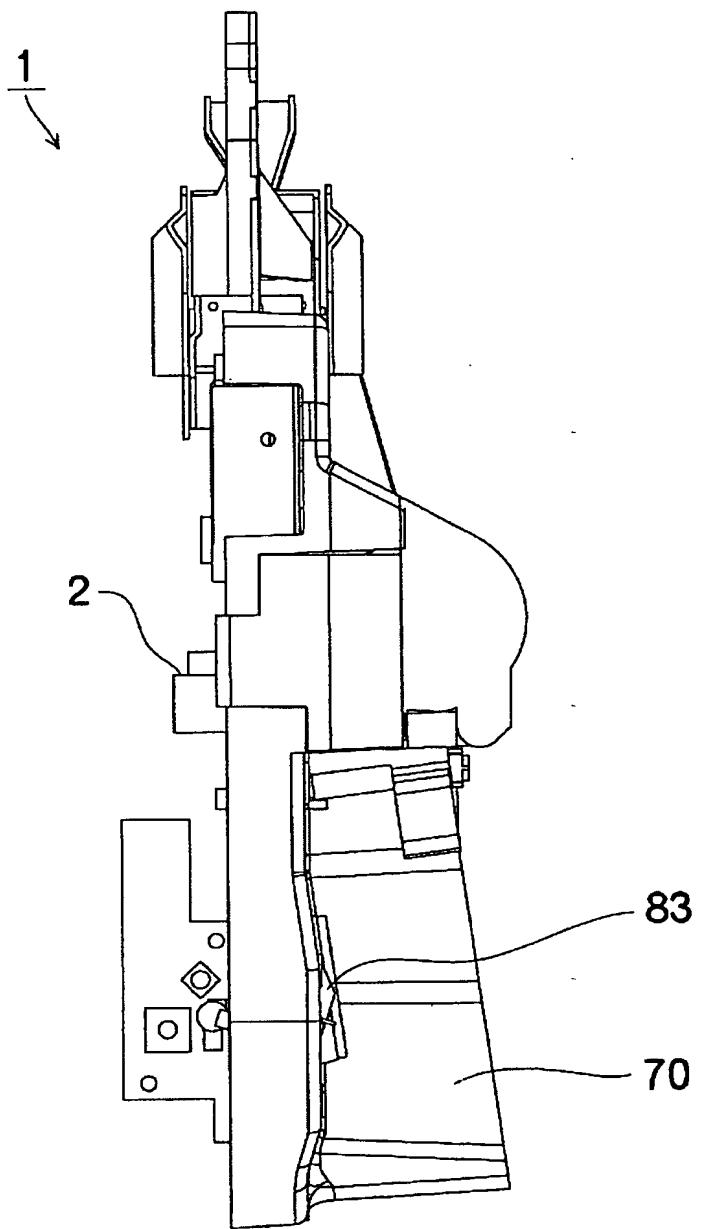


FIG. 9

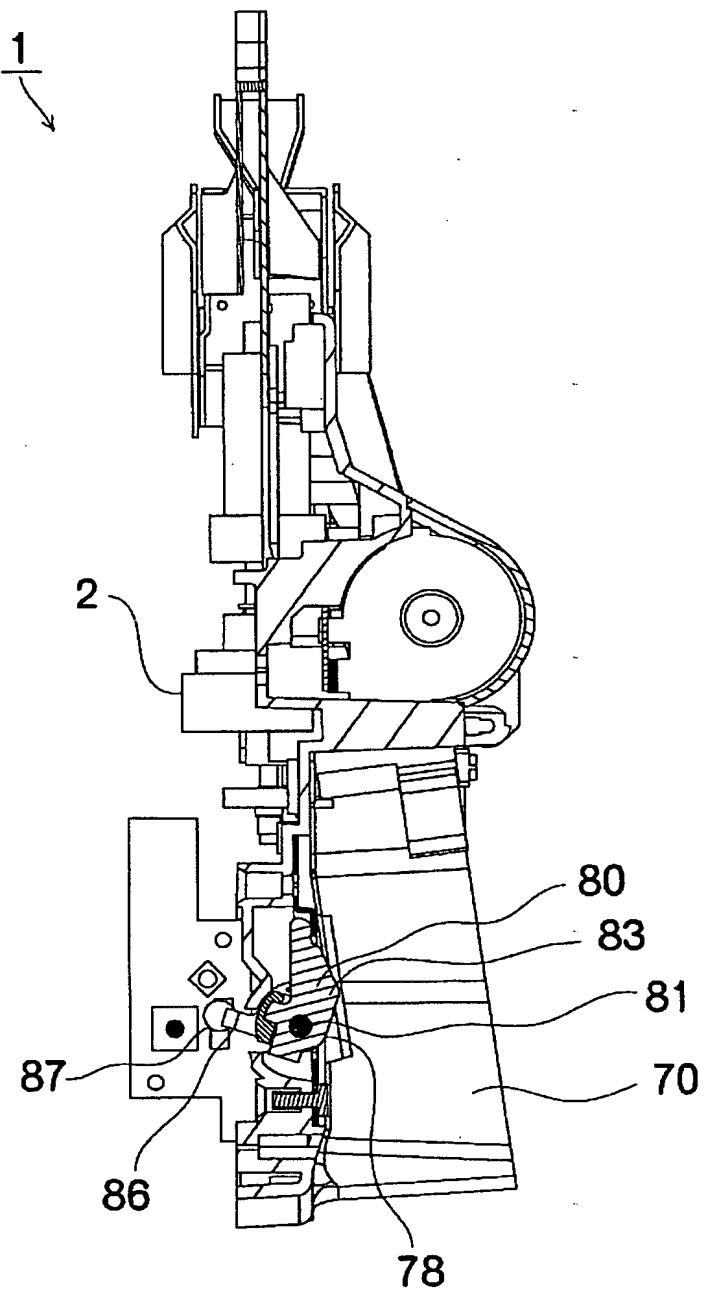


FIG. 10

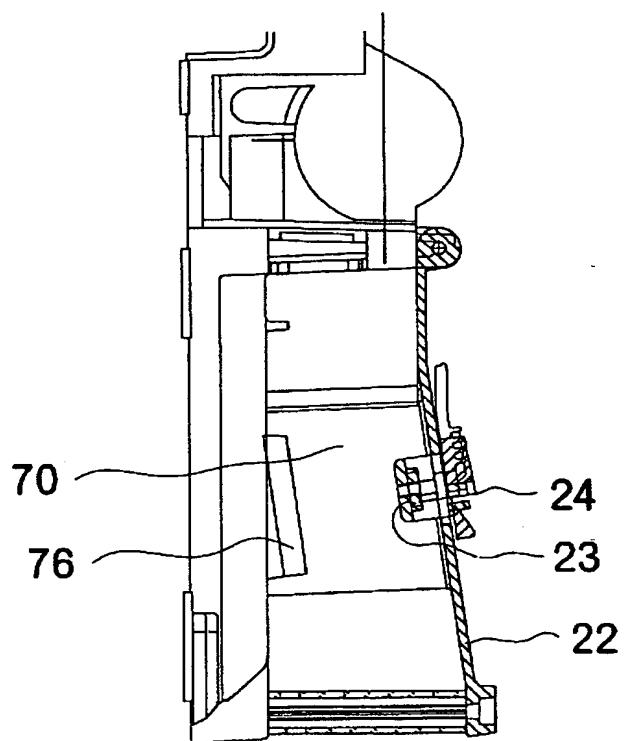


FIG. 11

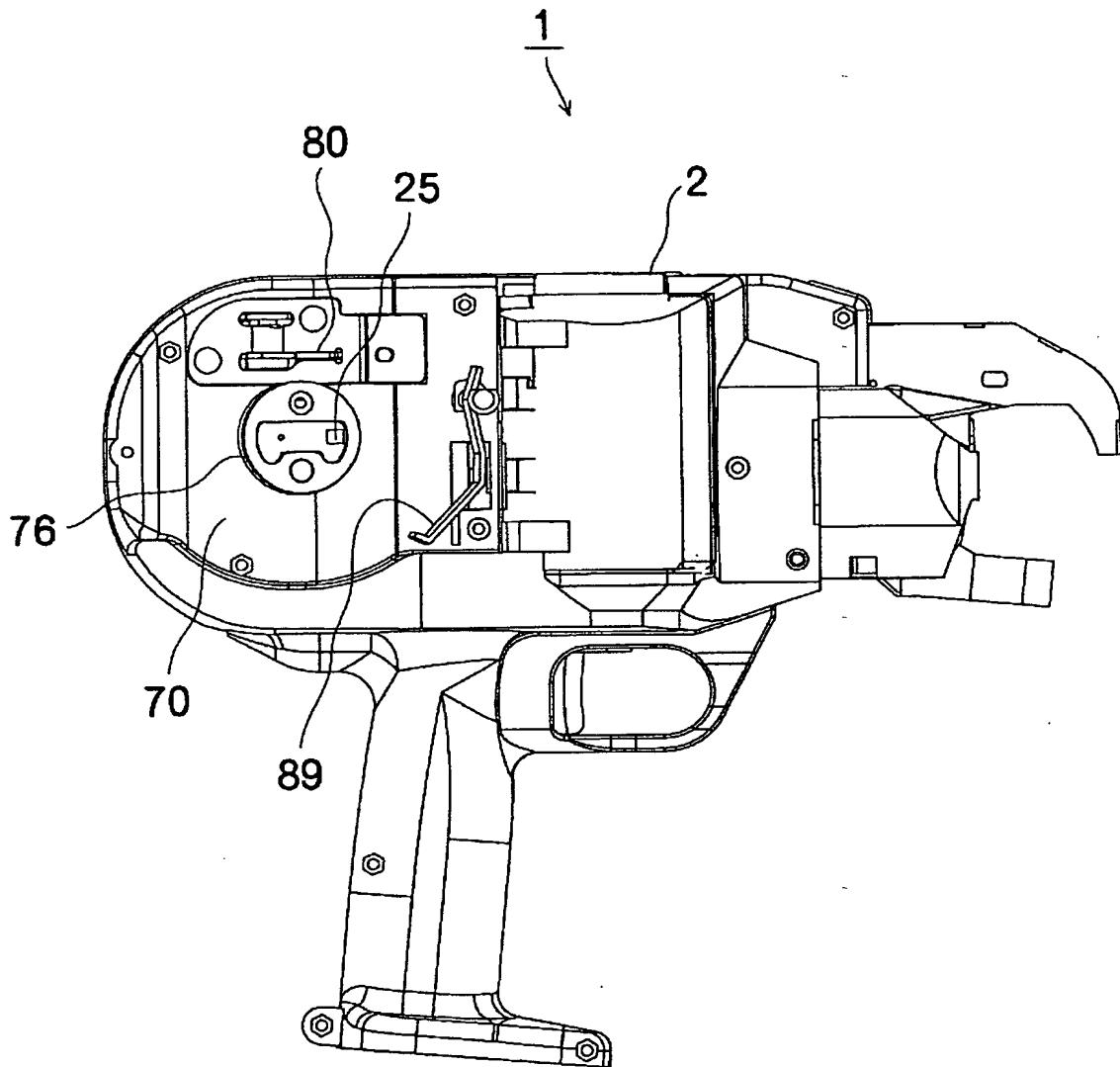


FIG. 12

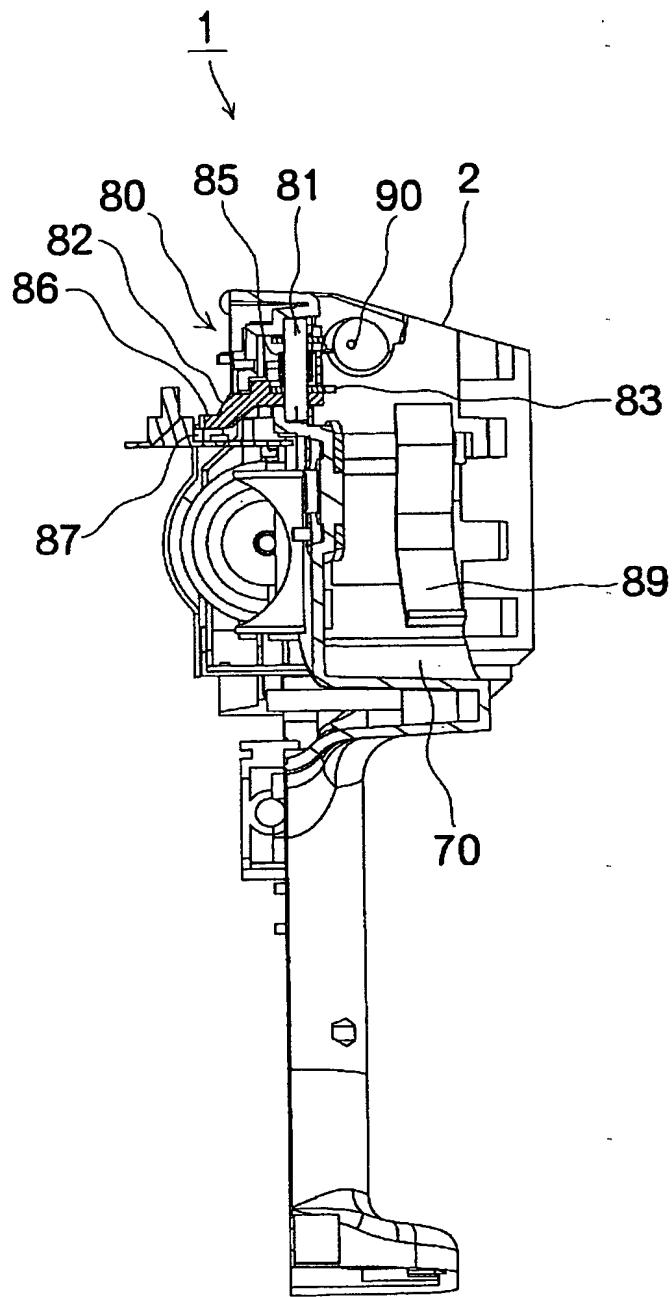


FIG. 13

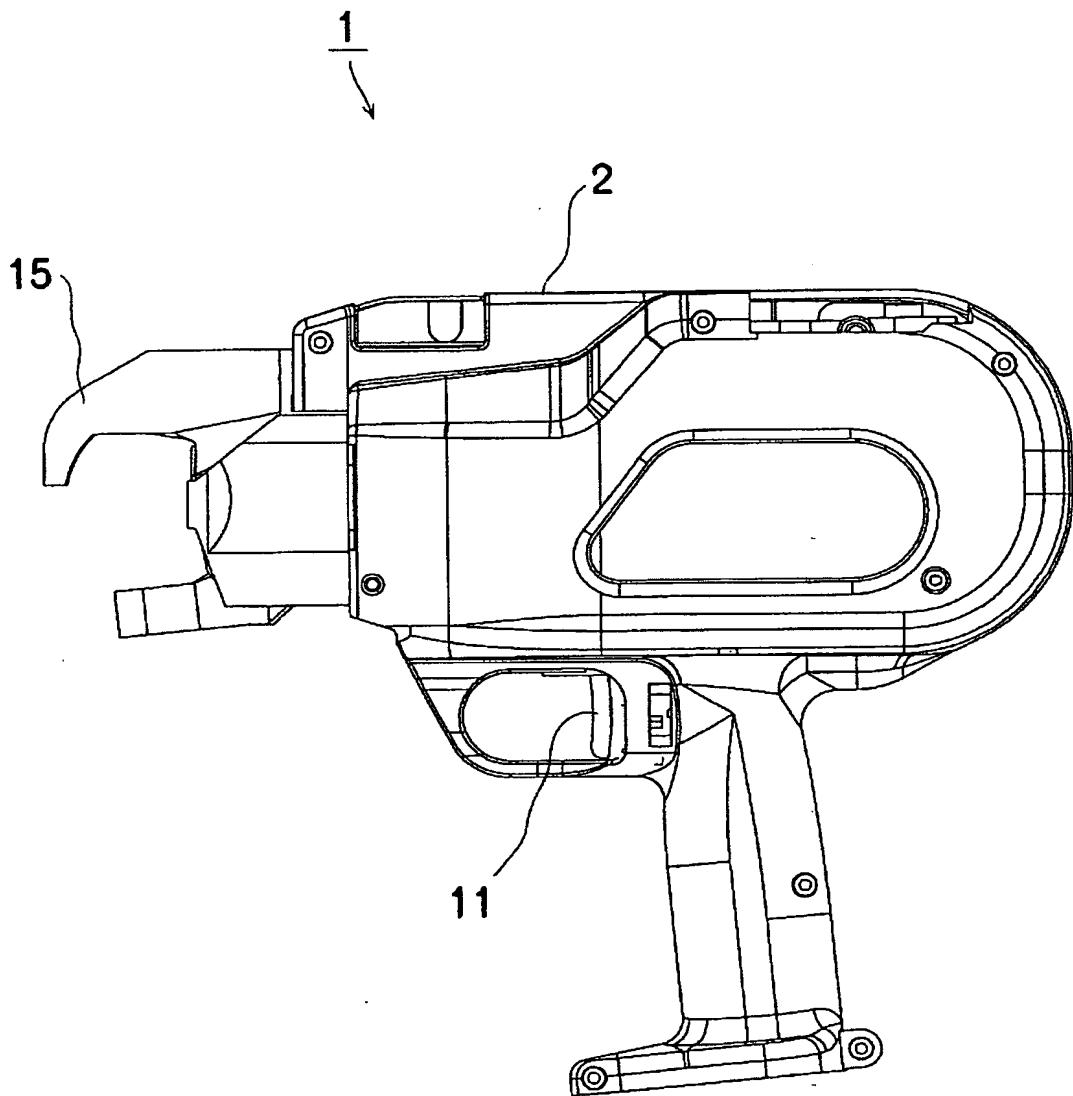


FIG. 14

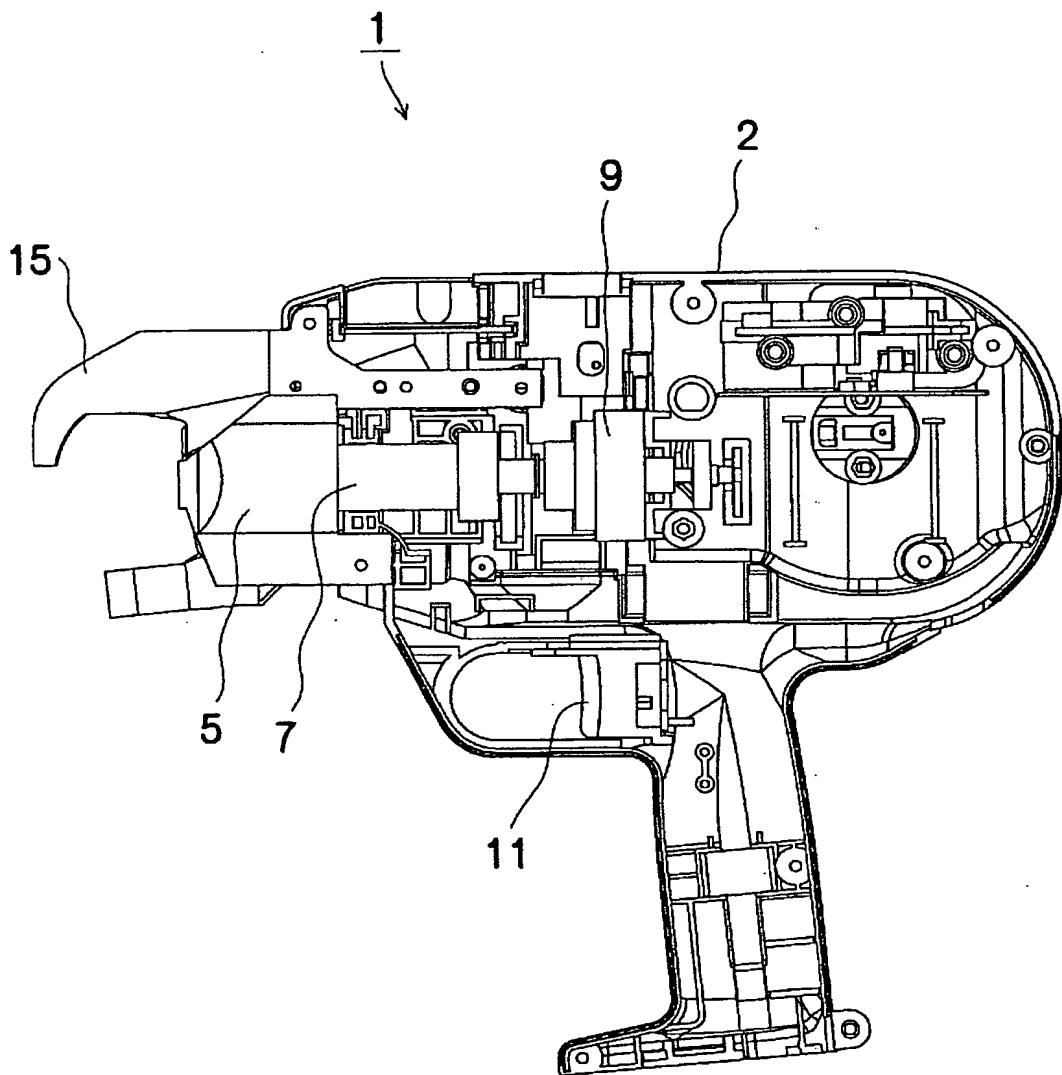
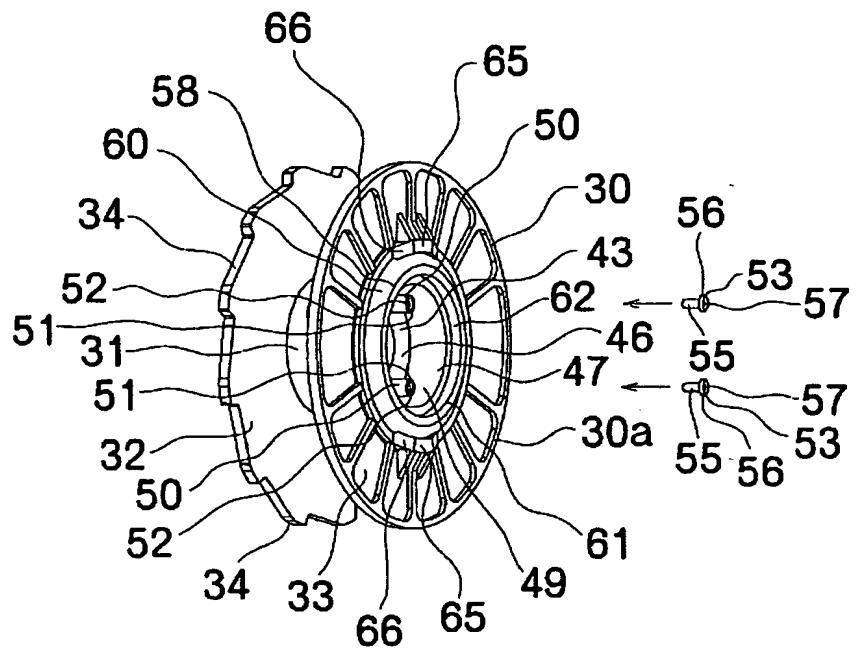


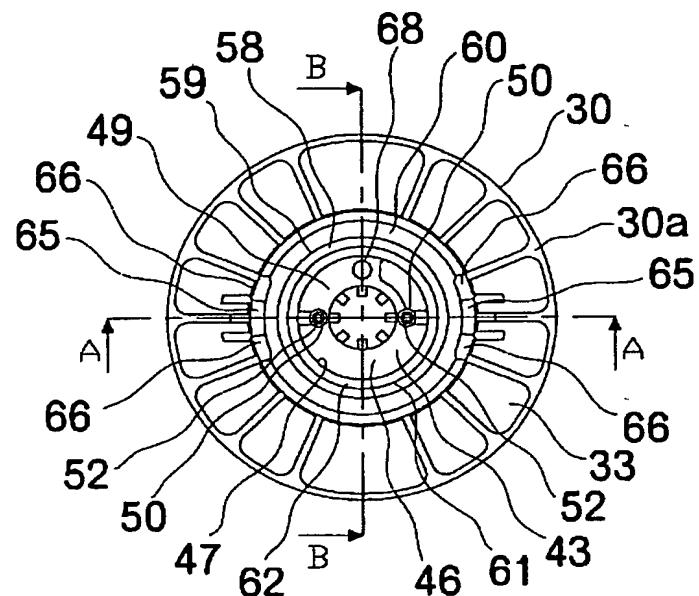
FIG. 15



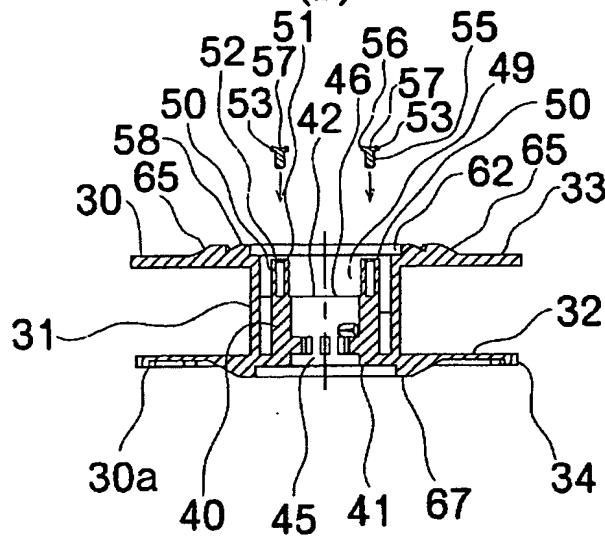
10/550595

FIG. 16

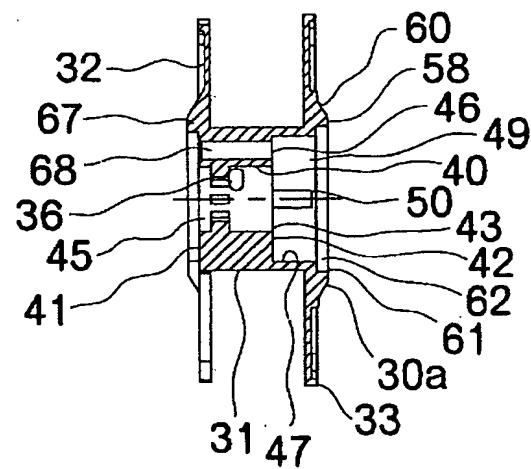
(a)



(b)



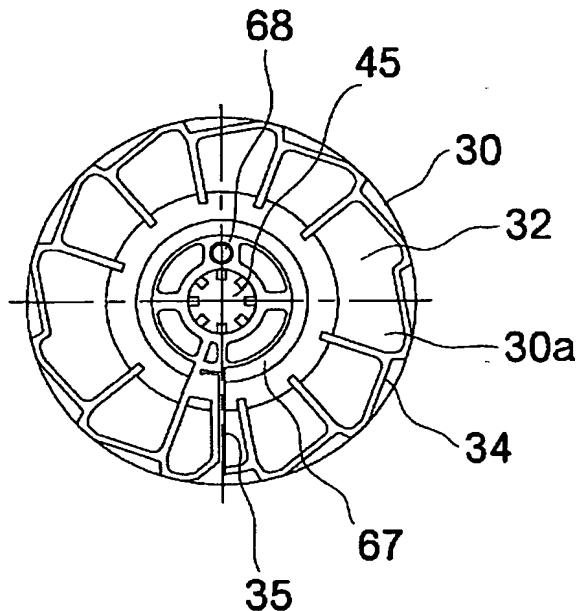
(c)



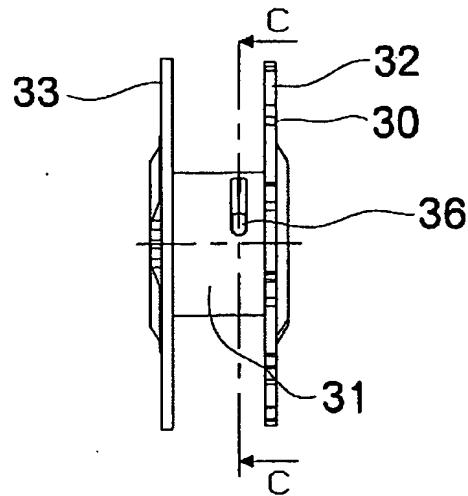
10/550595

FIG. 17

(a)



(b)



(c)

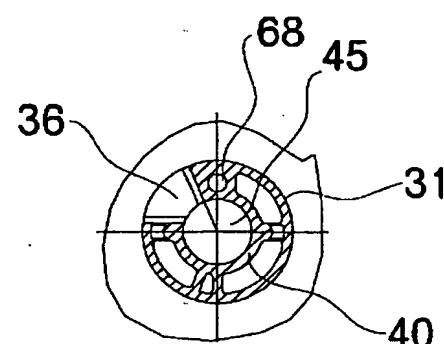
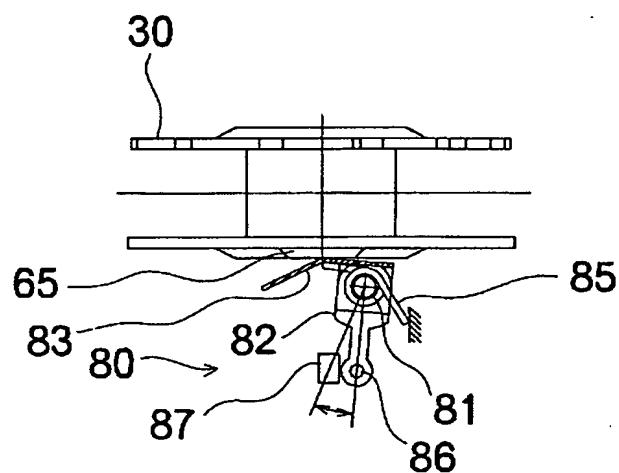
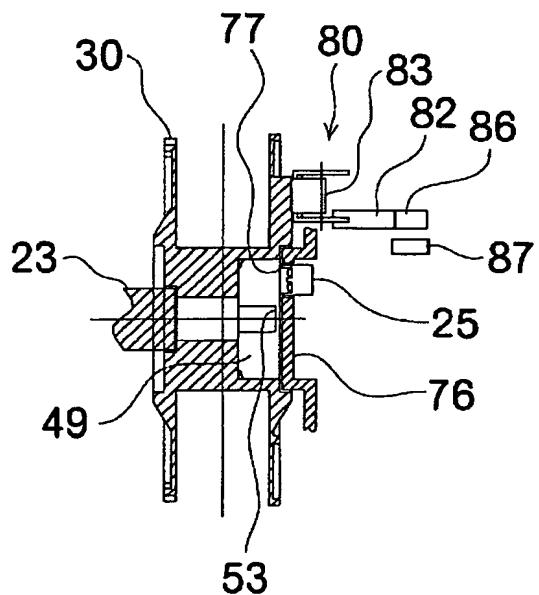


FIG. 18

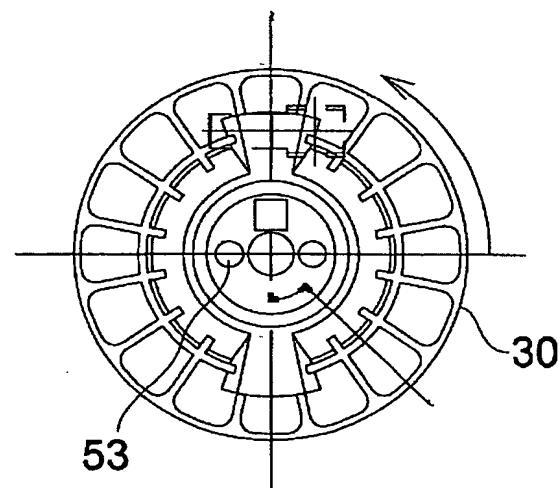
(a)



(c)

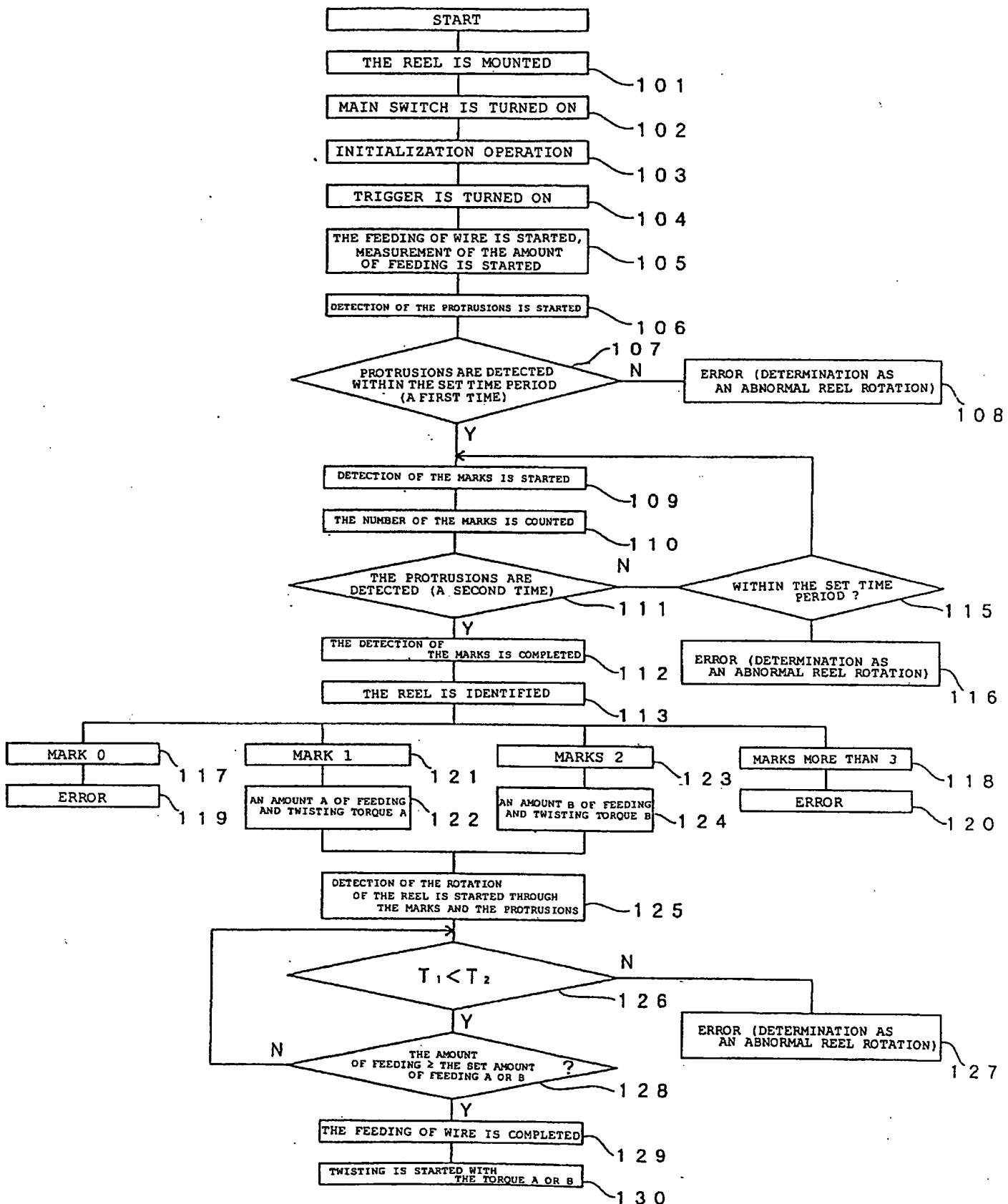


(b)



10/550595

FIG. 19



ENGLISH TRANSLATION OF FIG.19

Fig. 19

START

- 101) THE REEL IS MOUNTED
- 102) MAIN SWITCH IS TURNED ON
- 103) INITIALIZATION OPERATION
- 104) TRIGGER IS TURNED ON
- 105) THE FEEDING OF WIRE IS STARTED, MEASUREMENT OF THE AMOUNT OF FEEDING IS STARTED
- 106) DETECTION OF THE PROTRUSIONS IS STARTED
- 107) PROTRUSIONS ARE DETECTED WITHIN THE SET TIME PERIOD (A FIRST TIME)
- 108) ERROR (DETERMINATION AS AN ABNORMAL REEL ROTATION)
- 109) DETECTION OF THE MARKS IS STARTED
- 110) THE NUMBER OF THE MARKS IS COUNTED
- 111) THE PROTRUSIONS ARE DETECTED (A SECOND TIME)
- 112) THE DETECTION OF THE MARKS IS COMPLETED
- 113) THE REEL IS IDENTIFIED
- 115) WITHIN THE SET TIME PERIOD ?
- 116) ERROR (DETERMINATION AS AN ABNORMAL REEL ROTATION)
- 117) MARK 0
- 118) MARKS MORE THAN 3
- 119) ERROR
- 120) ERROR
- 121) MARK 1
- 122) AN AMOUNT A OF FEEDING AND TWISTING TORQUE A
- 123) MARKS 2

- 124) AN AMOUNT B OF FEEDING AND TWISTING TORQUE B
- 125) DETECTION OF THE ROTATION OF THE REEL IS STARTED THROUGH THE MARKS AND THE PROTRUSIONS
- 127) ERROR (DETERMINATION AS AN ABNORMAL REEL ROTATION)
- 128) THE AMOUNT OF FEEDING \geq THE SET AMOUNT OF FEEDING A OR B
- 129) THE FEEDING OF WIRE IS COMPLETED
- 130) TWISTING IS STARTED WITH THE TORQUE A OR B